



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Chi-YU Liao

5 Filing Date: 02/09/2001

Docket No.: API084

Serial No.: 09/779,463

#6
Huang
9/24/02

10 Title: METHOD OF PERFORMING A UNIFORM ILLUMINATION PATTERN
IN A BACK-LIGHT PLATE

To: Assistant Commissioner for Patents
Washington, D.C. 20231

15 Subject:

1. Information disclosure statement under 37C.F.R. §1.56.
2. Petition to request consideration of the information disclosure statement.

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20 Dear Sir:

25 This is an Information Disclosure Statement in accordance with the duty to disclose information material to patentability under 37 C.F.R. §1.56. Applicant wishes to make of record the document listed on the accompanying form PTO/SB/08. It is respectfully requested that the examiner initials the cited reference on the form and that it be made of record in the application and that a copy of the initialed form be sent to the applicant with the next communication from the examiner.

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35 Since the IDS is filed before the mailing date of a first Office action on the merits, a petition to request consideration of the information disclosure statement is hereby requested according to 37C.F.R. §1.97(b). The prior art patents contained in the information disclosure statement were cited in communications from the Taiwan Intellectual Property Office

on Jul. 24, 2002. Applicant sincerely hopes that the examiner can consider the item contained in the information disclosure statement.

5 According to the requirement set forth in 37 C.F.R. §1.98 and M.P.E.P. 609 (Rev.1, Feb. 2000), applicant is submitting a copy of the cited references (Taiwan Patent No.283,766, No.284,853, and No.216,210) and a concise explanation of the relevance in this application hereinafter.

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TP No.283,766 was filed with claim of priority based on USPTO patent application No.08/444,551, which is U.S. patent No.5,592,330 now. TP No.283,766 teaches a method and apparatus for forming retroreflective sheeting with improving daytime
15 whiteness performance, in which air spheres are encapsulated into the prism structure when the prism base body is laminated to the prisms in a mold. FIG. 1 is a fragmentary sectional view taken at location about a drum axis of a mold 16 illustrating the deposition of liquid prism 64 molding material thereunto
20 from a coating head 26 mounted thereabove. The apparatus of the invention includes a molding drum 100 mounted upon an axle or shaft for counterclockwise rotation. The circumferential portion of the drum 100 consists of a multiplicity of metallic plates 16 bonded to a circumferential base portion. Each of
25 the plates 16 is formed with a multiplicity of identical, contiguously arranged cube-corner recesses or indentations 22, and the plates 16 are provided entirely about the circumference of the drum 100 to provide a molding surface that has a substantially continuous array of cube-corner
30 recesses 22 therein. The coating head 26 is mounted about the drum 100 at one point about its circumference for reciprocal movement thereacross.

FIG. 2 is a fragmentary section to an enlarged scale of
35 the apparatus for applying a film of base material 46 by a roller 50 to the prism material 64 in the mold 16 to entrap

air bubbles in prisms. As the drum 100 continuously rotates, the hardenable molding material 64 in fluid form is deposited thereupon from the coating head 26. The film 46 is continuously withdrawn from a feed reel and applied against the drum 100 by the pressure roll 50, which cooperates with the drum 100 to provide a nip at which the hardenable material 64 is uniformly distributed over the surface of the mold plates 16, and at which intimate contact is effected between the material 64 and the film 46.

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FIG. 3 is a fragmentary view of the rear surface of a reflective sheeting 54. FIG. 4 is a fragmentary sectional view to an enlarged scale taken along the lines 4--4 of FIG. 3. Air spheres 10 can be introduced into retroreflecting microprisms 70 formed at this point in the process by the simple expedient of eliminating the customary step of pre-wetting the mold surface. The viscosity of the prism material 64 is such that, without the use of a wetting agent, the prism cavities 22 will not be completely filled. Air spheres 10 of various sizes are therefore entrapped in the prism bodies 70 when contact is made between the material 64 and the film 46.

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FIG. 5 is a view as in FIG. 4 with a white backing layer 12 added to the sheeting 54 for an air backed embodiment.

FIG. 6 is a view as in FIG. 4 with a metallic reflective layer 14 added for a metal reflector embodiment.

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FIG. 7 is a schematic ray-tracing drawing to illustrate certain principles of TP No.283,766.

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TP No.284,853 teaches a two-side plane light source. Fig. 1(a) is a ray trace diagram of a light source 1. The light source 1 is located in a housing 2. A reflection wall 4 positioned opposite to the light source 1 is used to reflect the light emitted from the light source 1.

Fig. 1(b) is another ray trace diagram of the light source 1. There are a plurality of transparent areas 3 formed on the housing 2. The light inside the housing 2 can radiate out through the transparent areas 3.

Fig. 2(a) indicates that the size of the transparent areas 3 is increased as the distance between the light source 1 and the transparent areas 3 is increased.

In Fig. 2(b), the horizontal axis represents the distance between the light source 1 and the transparent areas 3, and the vertical axis represents the diameter of the transparent areas 3. The diameter of the transparent areas 3 is increased as the distance between the light source 1 and the transparent areas 3 is increased.

Fig. 3(a) is a top view of a second embodiment plane light source. There are two light sources 1 opposite positioned at the sides of the housing 2, which has a plurality of the transparent areas 3.

In Fig. 3(b), the horizontal axis represents the distance between the transparent areas 3 and the right-side light source 1, and the vertical axis represents the diameter of the transparent areas 3. The diameter of the transparent areas 3 is increased as the distance between the transparent areas 3 and the middle of the housing 2 is decreased.

Fig. 4(a) is a top view of a third embodiment plane light source having a line light source 1.

Fig. 4(b) is a top view of a fourth embodiment plane light source having four line light sources 1 positioned at the four side of the housing 2.

Fig. 5(a) and Fig. 5(b) show a plane light source having a line light source 1 positioned at the middle of the housing 2.

5 Fig. 6 shows a plane light source having a line light source 1 positioned along a diagonal line of the housing 2.

Fig. 7(a) is a ray trace diagram of the light source 1. The light is reflected by a below surface of the housing 2.
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Fig. 7(b) is another ray trace diagram of the light source 1. A reflection plate 7 is added to reflect light so that a corresponding point C in Fig. 7(a) is shifted left.

15 In Fig. 7(c), the horizontal axis represents the distance between the light source 1 and the transparent areas 3, and the vertical axis represents the diameter of the transparent areas 3. The slope at a point G is greater than the slope at a point H.

20 Fig. 8(a) shows a plane light source having a light source 1 positioned at the center of the housing 2. The light source 1 has a circular shape.

25 Fig. 8(b) shows a plane light source having a light source 1 around the center of the housing 2. The light source 1 has a ring shape.

Fig. 9(a) ~ Fig. 10(b) show different plane light sources
30 having the transparent areas 3, which are narrow gaps having a predetermined length.

Fig. 11(a) and Fig. 11(b) show two plane light sources respectively comprising two walls 5 and 6, which have the
35 transparent areas 3. A reflection membrane 9 is positioned on the inner surface of the housing 2 for reflecting light.

Fig. 12 shows a plane light source having a reflection plate 7 installed inside the housing 2. There are two reflection plates 5a and 6a positioned adjacent to the light sources 1 for reflecting light.

Fig. 13(a) and Fig. 13(b) show two plane light sources respectively having a crooked reflection plate 8.

Fig. 14(a) shows a plane light sources having a light source 1 positioned at the center of the housing 2. The light source 1 has a circular shape.

Fig. 14(b) shows a plane light sources having two light sources 1 positioned at the corners of the housing 2. Each of the light sources 1 has a circular shape.

Fig. 15 shows a large-scale plane light source composed of four plane light sources 10. The connection parts E and F could be transparent so as to make the large-scale plane light source illuminated more uniformly.

Fig. 16, which is prior art disclosed in TP No.284,853, illustrates that fluorescent lamps 21 are positioned inside a housing 22, which has a diffusing plate 23.

Fig. 17(a), which is prior art disclosed in TP No.284,853, illustrates that a plane light source comprises a light source 1 positioned adjacent to a reflection surface 18. The plane light source further comprises a light guiding plate 12 for guiding the light emitted from the light source 1, a diffusing plate 13 for diffusing light emitted from the guiding plate 12, a prism sheet 14 for enhancing brightness, a plurality of dot patterns 15 for reflecting light, a reflection plate 16, and a reflection plate 17 positioned opposite to the light source 1.

Fig. 17(b) and Fig. 17(c) respectively illustrate that a separation P locates between an illuminating area Q and the light source 1.

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TP No.216,210 teaches a plane light source. In view of Fig.1, TP No.216,210 discloses a prior art embodiment plane light source having a guiding plate 2 for guiding light emitted from a light source 1. The guiding plate 2 has two ends 2a and 2b, and the end 2a is adjacent to the light source 1. A diffusing plate 3 is used to diffuse the light emitted from the guiding plate 2, and a reflection plate 4 for reflecting light.

15 Fig. 2 and Fig. 3, which are prior art disclosed in TP No.216,210, respectively illustrate that a plurality of lines for reflecting light are formed on a reflection surface of a guiding plate. The density of the lines varies with the distance between the light source and the location of the lines.

20

In view of Fig. 4, TP No.216,210 discloses another prior art embodiment plane light source having a light source 1 with two electrodes 1a, and a guiding plate 2 having a end 2a positioned adjacent to the light source 1. A plurality of patterns for reflecting light are formed on the guiding plate 2. The size of the patterns varies with the distance between the patterns and a location A.

25 In view of Fig. 5 and Fig. 6, TP No.216,210 further discloses another prior art embodiment plane light source having a light source 1, a guiding plate 2 with two ends 2a and 2b, a diffusing plate 3, a reflection plate 4, and a second reflection plate 5 positioned at the end 2b.

35 In Fig. Fig. 7, the horizontal axis represents the distance between the light source 1 and the end 2a in Fig. 6, and the

vertical axis represents the brightness. The brightness near the end 2b is greater than the average of brightness.

5 In view of Fig. 8, TP No.216,210 discloses a plane light source comprises a light source 1, a guiding plate 2, a diffusing sheet 3, and a reflection plate 4 having a reflection layer 4a.

10 Fig. 9 is a cross-sectional view of the plane light source shown in the Fig. 8.

15 Fig. 10 illustrates that a plurality of patterns 6 for reflecting light are formed on the reflection plate 4, and that the width of each pattern 6 varies with the distance between the pattern 6 and the light source 1.

Claim 1 of the present application is repeated below for reference:

20 "1. A method of forming a uniform illumination pattern in a back-light plate, the back-light plate comprising two parallel illuminating faces and an incident side on one side of the back-light plate, and when a visible light incidents from the incident side into the back-light plate,
25 the back-light plate reflect the visible light through the two illuminating faces, the method utilizing a press with a plurality of protruding elements to press an illuminating face of the back-light plate so as to form a plurality of recesses with predetermined depths thereon, wherein the
30 plurality of recesses forms the uniform illumination pattern on the back-light plate to make the back-light plate uniformly illuminated when the visible light incidents into the back-light plate."

35 The differences between claim 1 of the present application and the cited arts are described as follows:

Claim 1 of the present application claims that utilizing a press with a plurality of protruding elements to press an illuminating face of the back-light plate so as to form a plurality of recesses with predetermined depths thereon. The cited arts fail to teach or suggest that utilizing a press with a plurality of protruding elements to press an illuminating face of the back-light plate so as to form a plurality of recesses with predetermined depths thereon.

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Based on at least the above difference, it is believed that claim 1 of the present application is substantially different from the cited arts patent TP No.283,766, No.284,853, and No.216,210. And since claims 2~7 are dependent on claim 1, they are believed to be substantially different from the cited arts.

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Respectfully Submitted,

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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	09/779,463	
	Filing Date	02/09/2001	
	First Named Inventor	Chi-Yu Liao	
	Group Art Unit	2871	
	Examiner Name		
Total Number of Pages in This Submission	88	Attorney Docket Number	API 084

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Other Enclosure(s) (please identify below):
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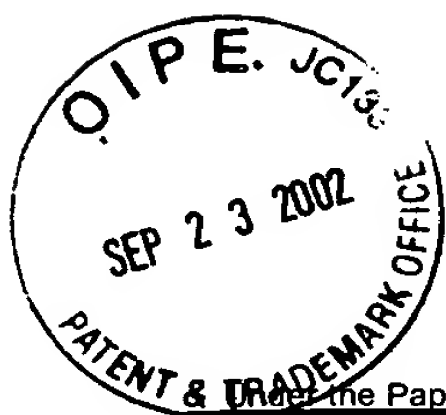
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	WINSTON HSU
Signature	<i>Winston Hsu</i>
Date	9/20/2002

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FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT (\$) 0.00

Complete if Known

Application Number	09/779,463
Filing Date	02/09/2001
First Named Inventor	Chi-Yu Liao
Examiner Name	
Group Art Unit	2871
Attorney Docket No.	API 084

METHOD OF PAYMENT

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: 50-0801
Deposit Account Name: North America International Patent Office

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☐ Payment Enclosed:

☐ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 740	201 370	Utility filing fee	
106 330	206 165	Design filing fee	
107 510	207 255	Plant filing fee	
108 740	208 370	Reissue filing fee	
114 160	214 80	Provisional filing fee	

SUBTOTAL (1) (\$) 0.00

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	X	
Multiple Dependent	-3** =	X	

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
103 18	203 9	Claims in excess of 20
102 84	202 42	Independent claims in excess of 3
104 280	204 140	Multiple dependent claim, if not paid
109 84	209 42	** Reissue independent claims over original patent
110 18	210 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 0.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for <i>ex parte</i> reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 920	217 460	Extension for reply within third month	
118 1,440	218 720	Extension for reply within fourth month	
128 1,960	228 980	Extension for reply within fifth month	
119 320	219 160	Notice of Appeal	
120 320	220 160	Filing a brief in support of an appeal	
121 280	221 140	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,280	241 640	Petition to revive - unintentional	
142 1,280	242 640	Utility issue fee (or reissue)	
143 460	243 230	Design issue fee	
144 620	244 310	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Processing fee under 37 CFR 1.17	
126 180	126 180	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 740	246 370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149 740	249 370	For each additional invention to be examined (37 CFR § 1.129(b))	
179 740	279 370	Request for Continued Examination (RCE)	
169 900	169 900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 0.00

SUBMITTED BY

Complete (if applicable)

Name (Print/Type)	WINSTON HSU	Registration No. (Attorney/Agent)	41,526	Telephone	886-2-8923-7350
Signature	<i>Winston Hsu</i>	Date	9/20/2002		

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